

PCT

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(57) Abstract: The present invention provides a hemodialysis or hemodiafiltration system and method using two dialyzer stages (122, 138), wherein the temperature of a dialysate fluid stream of the first cartridge (122) is increased such that the blood in the first cartridge (122) is dialyzed or diafiltered at an elevated temperature, while blood in the second cartridge (138) is dialyzed or diafiltered against a dialysate stream at normal blood temperature. This results in an increased solute diffusivity and a corresponding increase in removal of blood substances by diffusion. When diafiltration is performed, an additional removal of substances occurs by convection as a larger portion of plasma water from a blood compartment (142) can be filtered across a semi-permeable membrane (140) at the same transmembrane pressure due to the reduced viscosity of the heated blood and plasma water.

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